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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,534	01/10/2002	Homer Chou	00044X215193	6245

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EXAMINER
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VINH, LAN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/043,534

Applicant(s)

CHOU ET AL.

Examiner

Lan Vinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8, 10-13, 15-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motorani et al (US 6,447,695) in view of Sinha et al (US 6,551,935)

Motorani discloses an aqueous dispersion composition and a polishing system for CMP a substrate. The polishing system includes water/liquid carrier (col 2, lines 55-57), a polishing pad and abrasive (col 10, lines 21-23; col 3, lines 49-50), a hydroxyl coupling agent (col 4, lines 30-36). Motorani also discloses that the aqueous dispersion composition for CMP contains no oxidizing agent, the pH of the aqueous dispersion may be adjusted (col 6, lines 25-60), and various additives can be included in the composition (col 7, lines 5-6)

Unlike the instant claimed invention as per claim 1, Motorani fails to disclose using ammonium oxalate in the aqueous dispersion composition

Sinha discloses a method for using a planarizing solution comprises the step of using ammonium oxalate in an aqueous polishing composition employed in a polishing system includes a polishing pad and abrasives (col 5, lines 14-18; col 6, lines 15-20)

Since Motorani is directed to a polishing system for polishing metal using an aqueous dispersion composition/slurry that includes additive, one skilled in the art at the time the

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invention was made would have found it obvious to modify Motorani composition by adding ammonium oxalate in the aqueous dispersion composition as per Sinha because Sinha discloses that one or more buffers such as ammonium oxalate may be used to adjust the pH of the slurry to a desired level (col 6, lines 7-10)

Unlike the instant claimed invention as per claim 5, Motorani fails to disclose using a fixed abrasive polishing pad

Sinha also discloses using a fixed abrasive polishing pad in one of the embodiment (col 8, lines 33-34)

Hence, one skilled in the art at the time the invention was made would have found it obvious to modify Motorani polishing system by using a fixed abrasive polishing pad as per Sinha because Sinha discloses that clean pre-operative sections of the fix-abrasive pad may be quickly substituted for used sections to provide a consistent surface for planarizing (col 8, lines 38-42)

The limitations of claims 2-4, 6 have been discussed above

Regarding claims 7-8, Motorani discloses using silica as abrasive (Table 1)

Regarding claims 10-12, Motorani discloses using benzotriazole in the aqueous dispersion composition (col 6, lines 4-5)

Regarding claim 13, Motorani discloses using a silane-containing compound (col 4, lines 31-34)

Regarding claim 16, Motorani discloses that the pH of the composition is 1-9 (col 6, lines 30-31)

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Regarding claims 17-18, 20-24, 26-27, Motorani discloses polishing a substrate comprises Cu, Ta and TEOS wherein the Cu:TEOS removal rate is approximately 0.56/1:2 (Table 1)

3. Claims 9, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motorani et al (US 6,447,695) in view of Sinha et al (US 6,551,935) and further in view of Allman et al (US 6,541,383)

Motorani as modified by Sinha et al has been described above. Unlike the instant claimed invention as per claims 9, 14, Motorani and Sinha fail to specifically using ureidopropyltrimethoxylane as the hydroxyl agent

Allman discloses a method for polishing a semiconductor wafer comprises the step of using ureidopropyltrimethoxylane in the aqueous polishing composition (col 7, lines 30-34)

Hence, one skilled in the art at the time the invention was made would have found it obvious to modify Motorani and Sinha by using ureidopropyltrimethoxylane in the aqueous polishing composition as per Allman because Allman discloses that organofunctional silane such as ureidopropyltrimethoxylane can be utilized as adherence promoting ligands in the polishing composition (col 7, lines 10-13)

4. Claims 19, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motorani et al (US 6,447,695) in view of Sinha et al (US 6,551,935) and further in view of Ni (US 6,503,766)

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Motorani as modified by Sinha et has been described above. Unlike the instant claimed invention as per claims 19, 25, Motorani and Sinha fail to disclose the specific removal rate ratio of the Cu and Ta layer

Ni, in a method for CMP, discloses that a polishing rate can be optimized by adjusting a polishing parameter such as polishing agent flow (col 6, lines 3-7)

Thus, one skilled in the art at the time the invention was made would have found it obvious to modify Motorani and Sinha by adjusting the polishing agent flow to optimize the removal rate because Ni discloses that the polishing rate is a result-effective variable in the same field of endeavor

### ***Response to Arguments***

5. Applicant's arguments filed 10/14/2005 have been fully considered but they are not persuasive.

The applicants argue that in contrary to the office action, one of ordinary skill in the art, at the time of invention would not have been motivated to combine the disclosure of the Motorani and Sina patent in such a way as to arrive at the invention defined by the pending claims because rather than motivating the ordinarily skilled artisan to modify the aqueous dispersion disclosed in the Motorani patent in such a way as to arrive at the invention, the Sinha patent specifically teaches that slurries containing oxidizing agents are not suitable for the polishing of a tantalum-containing substrate , which is the subject of interest of Motorani. This argument is unpersuasive for the following reasons: it is noted that the inventions, defined by the pending claims 1-15, drawn to a

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system/apparatus claim and "APPARATUS CLAIMS MUST BE STRUCTUR-ALLY DISTINGUISHABLE FROM THE PRIOR ART, While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997)

MANNER OF OPERATING THE DEVICE DOES NOT DIFFERENTIATE  
APPARATUS CLAIM FROM THE PRIOR ART

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). In this case, since the combination of Motorani and Sinha teaches all the structural limitations as defined by claim 1, claim 1 is not distinguishable from the combination of Motorani and Sinha.

Although the examiner recognizes that pending claims 16-27 are directed to the method claims and the Sinha patent specifically teaches that slurries containing oxidizing agents are not suitable for the polishing of a tantalum-containing substrate, the examiner proposed to modify Motorani composition by adding the teaching of using ammonium oxalate as a pH control agent as per Sinha, in the Motorani composition, the proposed combination of Motorani and Sinha does not involve the incorporation of Sinha slurries into Motorani composition.

In response to applicant's argument that there is no suggestion to combine the references of Motorani and Sinha, the examiner recognizes that obviousness can only

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be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, since Motorani discloses that the pH of the aqueous dispersion may be adjusted (col 6, lines 37-39) and Sinha teaches using ammonium oxalate as a pH control agent, one skilled in the art at the time the invention was made would have found it obvious to employ Sinha teaching in Motorani composition to produce the claimed invention

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant's arguments with respect to the reference of Ni have been fully considered but they are not persuasive. Applicants argue that Ni does not disclose any polishing composition or polishing system. This argument is unpersuasive because as recited in col 6, lines 10-22 in Ni, Ni discloses a polishing device capable of perform CMP. Thus, the examiner maintains that one skilled in the art at the time the invention was made



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would have found it obvious to employ Ni teaching in Motorani and Sinha method to produce the claimed invention

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



LV  
December 9, 2005